

CLAIMS:

What is claimed is:

1. A method for performing a concurrent automated LIC update on a storage controller, comprising the steps of:
 - (A.) installing LIC update software on a first cluster and a second cluster;
 - (B.) continuing operation of said storage controller with at least one of said first cluster and said second cluster while updating a first cluster firmware on said first cluster and updating a second cluster firmware on said second cluster;
 - (C.) verifying said first cluster firmware on said first cluster; and
 - (D.) verifying said second cluster firmware on said second cluster.
2. The method of claim 1, wherein step B further comprises the steps of:
 - (A.) quiescing said second cluster;
 - (B.) transferring operation control of said storage controller to said first cluster;
 - (C.) rebooting said second cluster;
 - (D.) updating said second cluster firmware on said second cluster;
 - (E.) rebooting said second cluster;
 - (F.) transferring operation control of said storage controller to said second cluster;
 - (G.) quiescing said first cluster;
 - (H.) rebooting said first cluster;
 - (I.) updating said first cluster firmware on said first cluster;
 - (J.) rebooting said first cluster; and
 - (K.) transferring operation control of said storage controller to said first cluster and said second cluster.
3. The method of claim 1, further comprising the steps of:
 - (A.) installing said LIC update software on a backup drive on said first cluster; and
 - (B.) installing said LIC update software on a backup drive on said second cluster.
4. The method of claim 1, further comprising the steps of:

- (A.) running an automated LIC dispatcher process that calls state actions from a state action table, wherein said state action table comprises a plurality of individual state actions to perform said concurrent automated LIC update.
5. A method for performing a nonconcurrent automated LIC update on a storage controller, comprising the steps of:
- (A.) installing LIC update software on a first cluster and a second cluster;
 - (B.) suspending operation of said storage controller;
 - (C.) quiescing said first cluster;
 - (D.) quiescing said second cluster;
 - (E.) rebooting said first cluster;
 - (F.) rebooting said second cluster;
 - (G.) transferring LIC update process control of said storage controller to said first cluster;
 - (H.) updating a first cluster firmware on said first cluster;
 - (I.) updating a second cluster firmware on said second cluster;
 - (J.) rebooting said first cluster;
 - (K.) rebooting said second cluster; and
 - (L.) transferring operation control of said storage controller to said first cluster and said second cluster.
6. The method of claim 5, further comprising the steps of:
- (A.) verifying said first cluster firmware on said first cluster; and
 - (B.) verifying said second cluster firmware on said second cluster.
7. The method of claim 5, further comprising the steps of:
- (A.) installing LIC update software on a backup drive on said first cluster; and
 - (B.) installing LIC update software on a backup drive on said second cluster.
8. The method of claim 5, further comprising the steps of:
- (A.) running an automated LIC dispatcher process that calls state actions from a state action table, wherein said state action table comprises a plurality of individual state actions to perform said nonconcurrent automated LIC update.
9. A system for automatically updating LIC on a storage controller, comprising:
- a first cluster;

a second cluster;
a communication line between said first cluster and said second cluster;
a state action table, wherein said state action table comprises a plurality of individual state actions for a concurrent automated LIC update;
an automated LIC dispatcher executing said state actions from said state action table to perform method steps comprising:

- (A.) installing LIC update software on said first cluster and said second cluster;
- (B.) continuing operation of said storage controller with at least one of said first cluster and said second cluster while updating a first cluster firmware on said first cluster and updating a second cluster firmware on said second cluster;
- (C.) verifying said first cluster firmware on said first cluster; and
- (D.) verifying said second cluster firmware on said second cluster.

10. The system of claim 9, wherein step B further comprises the steps of:

- (A.) quiescing said second cluster;
- (B.) transferring operation control of said storage controller to said first cluster;
- (C.) rebooting said second cluster;
- (D.) updating said second cluster firmware on said second cluster;
- (E.) rebooting said second cluster;
- (F.) transferring operation control of said storage controller to said second cluster;
- (G.) quiescing said first cluster;
- (H.) rebooting said first cluster;
- (I.) updating said first cluster firmware on said first cluster;
- (J.) rebooting said first cluster; and
- (K.) transferring operation control of said storage controller to said first cluster and said second cluster.

11. The system of claim 9, wherein said method steps further comprise the steps of:

- (A.) installing said LIC update software on a backup drive on said first cluster; and
- (B.) installing said LIC update software on a backup drive on said second cluster.

12. A system for automatically updating LIC on a storage controller, comprising:

a first cluster;

- a second cluster;
- a communication line between said first cluster and said second cluster;
- a state action table, wherein said state action table comprises a plurality of individual state actions for a nonconcurrent automated LIC update;
- an automated LIC dispatcher executing state actions from said state action table to perform method steps comprising:
 - (A.) installing LIC update software on said first cluster and said second cluster;
 - (B.) suspending operation of said storage controller;
 - (C.) quiescing said first cluster;
 - (D.) quiescing said second cluster;
 - (E.) rebooting said first cluster;
 - (F.) rebooting said second cluster;
 - (G.) transferring LIC update process control of said storage controller to said first cluster;
 - (H.) updating a first cluster firmware on said first cluster;
 - (I.) updating a second cluster firmware on said second cluster;
 - (J.) rebooting said first cluster;
 - (K.) rebooting said second cluster; and
 - (L.) transferring operation control of said storage controller to said first cluster and said second cluster.

13. The system of claim 12, wherein said method steps further comprise the steps of:

- (A.) verifying said first cluster firmware on said first cluster; and
- (B.) verifying said second cluster firmware on said second cluster.

14. The system of claim 12, wherein said method steps further comprise the steps of:

- (A.) installing LIC update software on a backup drive on said first cluster; and
- (B.) installing LIC update software on a backup drive on said second cluster.

15. An article of manufacture comprising a data storage medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform method steps for automatically updating LIC on a storage controller, said storage controller comprising a first cluster, a second cluster, a communication line between said first cluster and said second cluster, a state action table, wherein said state action table comprises a plurality of

individual state actions for a concurrent automated LIC update and an automated LIC dispatcher executing said state actions from said state action table, said method steps comprising

- (A.) installing LIC update software on said first cluster and said second cluster;
- (B.) continuing operation of said storage controller with at least one of said first cluster and said second cluster while updating a first cluster firmware on said first cluster and updating a second cluster firmware on said second cluster;
- (C.) verifying said first cluster firmware on said first cluster; and
- (D.) verifying said second cluster firmware on said second cluster.

16. The article of manufacture of claim 15, wherein step B further comprises the steps of:

- (A.) quiescing said second cluster;
- (B.) transferring operation control of said storage controller to said first cluster;
- (C.) rebooting said second cluster;
- (D.) updating said second cluster firmware on said second cluster;
- (E.) rebooting said second cluster;
- (F.) transferring operation control of said storage controller to said second cluster;
- (G.) quiescing said first cluster;
- (H.) rebooting said first cluster;
- (I.) updating said first cluster firmware on said first cluster;
- (J.) rebooting said first cluster; and
- (K.) transferring operation control of said storage controller to said first cluster and said second cluster.

17. The article of manufacture of claim 15, wherein said method steps further comprise the steps of:

- (A.) installing said LIC update software on a backup drive on said first cluster; and
- (B.) installing said LIC update software on a backup drive on said second cluster.

18. An article of manufacture comprising a data storage medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform method steps for automatically updating LIC on a storage controller, said storage controller comprising a first cluster, a second cluster, a communication line between said first cluster and

said second cluster, a state action table, wherein said state action table comprises a plurality of individual state actions for a nonconcurrent automated LIC update and an automated LIC dispatcher executing said state actions from said state action table, said method steps comprising:

- (A.) installing LIC update software on said first cluster and said second cluster;
- (B.) suspending operation of said storage controller;
- (C.) quiescing said first cluster;
- (D.) quiescing said second cluster;
- (E.) rebooting said first cluster;
- (F.) rebooting said second cluster;
- (G.) transferring LIC update process control of said storage controller to said first cluster;
- (H.) updating a first cluster firmware on said first cluster;
- (I.) updating a second cluster firmware on said second cluster;
- (J.) rebooting said first cluster;
- (K.) rebooting said second cluster; and
- (L.) transferring operation control of said storage controller to said first cluster and said second cluster.

19. The article of manufacture of claim 18, wherein said method steps further comprise the steps of:

- (A.) verifying said first cluster firmware on said first cluster; and
- (B.) verifying said second cluster firmware on said second cluster.

20. The article of manufacture of claim 18, wherein said method steps further comprise the steps of:

- (A.) installing LIC update software on a backup drive on said first cluster; and
- (B.) installing LIC update software on a backup drive on said second cluster.